

ΥΠΟΥΡΓΕΙΟ ΠΑΙΔΕΙΑΣ ΚΑΙ ΠΟΛΙΤΙΣΜΟΥ
ΔΙΕΥΘΥΝΣΗ ΜΕΣΗΣ ΕΚΠΑΙΔΕΥΣΗΣ
ΛΕΥΚΩΣΙΑ

ΠΑΓΚΥΠΡΙΕΣ ΓΡΑΠΤΕΣ ΕΞΕΤΑΣΕΙΣ 2011 (ΓΙΑ ΑΠΟΛΥΣΗ)

Α΄ ΣΕΙΡΑ ΕΞΕΤΑΣΕΩΝ

ΜΑΘΗΜΑ : ΔΙΚΤΥΑ - CISCO

ΧΡΟΝΟΣ : 2 ώρες

ΗΜΕΡΟΜΗΝΙΑ : 10 Μαΐου

ΩΡΑ ΕΝΑΡΞΗΣ : 7.45 π.μ.

ΤΟ ΕΞΕΤΑΣΤΙΚΟ ΔΟΚΙΜΙΟ ΑΠΟΤΕΛΕΙΤΑΙ ΑΠΟ ΕΝΤΕΚΑ(11) ΣΕΛΙΔΕΣ

Οδηγίες:

- Να απαντήσετε σε όλες τις ερωτήσεις
- Όλες οι απαντήσεις να γραφούν στο τετράδιο απαντήσεων
- Επιτρέπεται η χρήση μη προγραμματιζόμενης υπολογιστικής μηχανής

ΜΕΡΟΣ Α. (30 μονάδες)

Να απαντήσετε και στις είκοσι (20) ερωτήσεις πολλαπλής επιλογής. Η κάθε ερώτηση βαθμολογείται με 1 ½ μονάδα.

Ερώτηση 1. (Chapter 1)

A company needs to connect an office router to a service provider to access a WAN. What device is needed to connect the router to the ISP if the service provider supplies a T1 line for the connection?

- (a) a CSU/DSU
- (b) a cable modem
- (c) a DSL router
- (d) a DTE device
- (e) an SLA device

Ερώτηση 2. (Chapter 1)

When does a host device issue an ICMP echo request?

- (a) to respond to a DNS name query
- (b) to initiate a ping to determine if a destination address is reachable
- (c) to broadcast its identity to its locally connected neighbors
- (d) to request the MAC address of a destination IP address

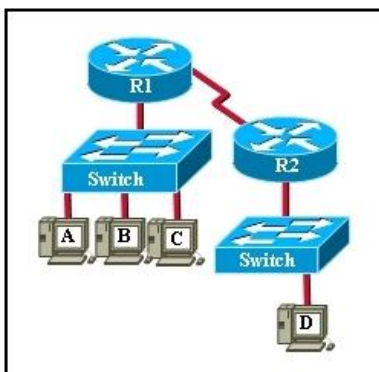
Ερώτηση 3. (Chapter 1)

What feature enables network devices to be scalable?

- (a) a fixed number of interfaces
- (b) ease of repair
- (c) modularity
- (d) low maintenance requirements
- (e) low cost

Ερώτηση 4. (Chapter 2)

Refer to the exhibit. The switches are in their default configuration. Host A needs to communicate with host D, but host A does not have the MAC address for its default gateway. Which network hosts will receive the ARP request sent by host A?



- (a) only host D
- (b) only router R1
- (c) only hosts A, B, and C
- (d) only hosts A, B, C, and D
- (e) only hosts B and C
- (f) only hosts B, C, and router R1

Ερώτηση 5. (Chapter 2)

Which scenario represents a problem at Layer 4 of the OSI model?

- (a) An incorrect IP address on the default gateway.
- (b) A firewall filtering traffic addressed to TCP port 25 on an email server.
- (c) A bad subnet mask in the host IP configuration.
- (d) An incorrect DNS server addresses being given out by DHCP.

Ερώτηση 6. (Chapter 3)

Which cabling is referred to as horizontal cabling?

- (a) The backbone
- (b) Short cables between a patch panel and a switch or router
- (c) Cables between an IDF and the MDF
- (d) Cables between the IDF and the network nodes (hosts)
- (e) All cables running horizontally in a building

Ερώτηση 7. (Chapter 3)

A network technician is assigned to perform a site visit to a customer location to determine the requirements for a network upgrade. In addition to the currently installed equipment inventory, what other information about the hosts and networking devices should the technician obtain from the customer?

- (a) the cost of the currently installed equipment
- (b) all product keys for site license software
- (c) any planned growth anticipated in the near future
- (d) the memory requirements for installed application software

Ερώτηση 8. (Chapter 4)

A network host has the IP address 10.250.206.55/22. How many more network devices (hosts) can be added to the same subnet?

- (a) 253
- (b) 509
- (c) 1021
- (d) 2045
- (e) 4093

Ερώτηση 9. (Chapter 4)

What is the broadcast address for the network where host 174.168.20.25 belongs, if the default subnet mask is used?

- (a) 174.168.20.31
- (b) 174.168.20.255
- (c) 174.168.255.255
- (d) 174.168.255.0
- (e) 174.255.255.255

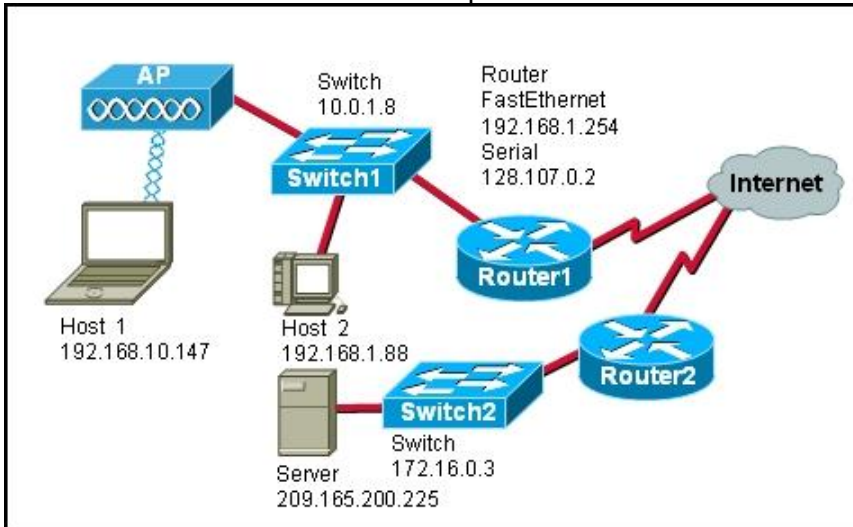
Ερώτηση 10. (Chapter 5)

A router has a valid operating system and a configuration stored in NVRAM. When the router boots up, which mode will display?

- (a) global configuration mode
- (b) setup mode
- (c) ROM monitor mode
- (d) user EXEC mode

Ερώτηση 11. (Chapter 5)

Refer to the exhibit. Router1 receives a packet addressed as follows:



Source IP address: 192.168.1.88
 Destination IP address: 172.16.0.3
 Source MAC address: 00-11-12-7a-41-10
 Destination MAC address: 00-11-5c-cc-a9-c0
 Source Port: 1464, Destination Port: 23

Assuming that Router1 has not been configured with NAT, what will happen to the packet?

- (a) The packet will be sent to the server because it is a server-based port.
- (b) The packet will be sent to Switch2 and not leave the switch because the packet is local.
- (c) The packet will be sent to Host 2.
- (d) Router1 will drop the packet because private addresses are not transmitted across the Internet.
- (e) The packet will be sent to Router2 and dropped because no host is configured to receive the packet.

Ερώτηση 12. (Chapter 5)

Which two statements are true about the NVRAM on a Cisco device?

- (a) stores the routing table, contains the running configuration file.
- (b) retains contents when power is removed, stores the startup configuration file .
- (c) contains the running configuration file, stores the ARP table .
- (d) retains contents when power is removed, contains the running configuration file.

Ερώτηση 13. (Chapter 6)

Why is fast convergence desirable in networks that use dynamic routing protocols?

- (a) Routers will not allow packets to be forwarded until the network has converged.
- (b) Hosts are unable to access their gateway until the network has converged.
- (c) Routers may make incorrect forwarding decisions until the network has converged.
- (d) Routers will not allow configuration changes to be made until the network has converged.

Ερώτηση 14. (Chapter 6)

Which part of an IP packet does the router use to make routing decisions?

- (a) source IP address
- (b) destination MAC address
- (c) source MAC address
- (d) destination IP address

Ερώτηση 15. (Chapter 7)

What type of update allows client computers to register and update their resource records with a DNS server whenever changes occur?

- (a) dynamic
- (b) zone transfer
- (c) local recursive query
- (d) root domain query
- (e) top-level domain query

Ερώτηση 16. (Chapter 7)

Within TCP, what combination makes up a socket pair?

- (a) source port with destination port
- (b) source IP address with destination port
- (c) source IP address and port with a destination IP address and port
- (d) source IP address and destination IP address

Ερώτηση 17. (Chapter 8)

Which benefit does SSH offer over Telnet when remotely managing a router?

- (a) authorization
- (b) connection using six VTY lines
- (c) encryption
- (d) TCP usage

Ερώτηση 18. (Chapter 8)

What is the advantage of using WPA to secure a wireless network?

- (a) It uses a 128-bit pre-shared hexadecimal key to prevent unauthorized wireless access.
- (b) It uses an advanced encryption key that is never transmitted between host and access point.
- (c) It is supported on older wireless hardware, thus providing maximum compatibility with enterprise equipment.
- (d) It requires the MAC address of a network device that is requesting wireless access to be on a list of approved MAC addresses.

Ερώτηση 19. (Chapter 9)

Refer to the exhibit. What can be determined from the output of the ping command?

```
Router1> ping 172.16.101.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.101.2,
Timeout is 2 seconds:
.!!!!
Success rate is 80 percent, round-trip min/avg/max=6/6/6 ms
Router1>
```

- (a) There was a destination unreachable error.
- (b) The packet type was unknown.
- (c) The ping was interrupted.
- (d) Four packets of data were successfully received.
- (e) The packet TTL was exceeded.

Ερώτηση 20. (Chapter 9)

A user can access any web page on the Internet but cannot access e-mail. What troubleshooting method would be most efficient for troubleshooting this issue?

- (a) top-down
- (b) bottom-up
- (c) divide-and-conquer
- (d) impossible to determine from this information

Μέρος Β (30 μονάδες)

Να απαντήσετε σε όλες τις ερωτήσεις. Η κάθε ερώτηση βαθμολογείται με έξι (6) μονάδες.

Ερώτηση 1. (Chapter 5)

Fill in the blanks in the following statements:

(1 pt for each statement)

- (a) Routers make forwarding decisions based on entries in the Routing Table.
- (b) A static route does not change until the administrator manually reconfigures it.
- (c) In order for two routers to exchange routes, they must use the same routing protocol.
- (d) A set of networks controlled by a single administrative authority using the same internal routing policy throughout is called an Autonomous System.
- (e) RIP is a common distance vector routing protocol. This protocol allows a maximum of 15 hops therefore it cannot be used for networks that connect more than 16 routers in series.
- (f) Packets to unknown networks are forwarded based on the Default Route.

Ερώτηση 2. (Chapter 1)

Match each ISP Service Team (left table) with one of the 6 responsibilities listed in table to the right. Write in your answer book the number (1-6) corresponding to a responsibility, along with the matching ISP Service Team letter (A-E). (1 pt for each answer)

ISP Service Teams	
A	Customer Service
B	Planning and Provisioning
C	On-site Installation
D	Network Operations Center
E	Help Desk

Responsibility		Match
1	Monitors and tests new connections	D
2	Installs circuits on customer sites	C
3	Receives and enters customers orders	A
4	Assists the customer in setting up and using their circuit	E
5	Determines if customer has needed equipment or if new equipment is needed.	B
6	Opens the trouble ticket	E

Ερώτηση 3. (Chapter 2)

Identify the layer in which each of the protocols or technology terms listed below belongs to. Copy the table in your answer book and write each item in the list in its corresponding column.

(0.5 pt for each answer)

UDP, Hubs, Packets, SMTP, Frames, Network Switching, TCP, Telnet, Electrical signalling, Port Numbers, Routing, MAC addresses

Physical Layer	Data link Layer	Network Layer	Transport Layer	Upper Layers
Hubs	Frames	Packets	Port Numbers	SMTP
Electrical signaling	Network Switching	Routing	TCP	Telnet
	MAC addresses		UDP	

Ερώτηση 4. (Chapter 3)

Match each term (A-H) with the sentence that best describes it (1-6). Write in your answer book the letter (A-H) corresponding to a term along with a number (1-6) corresponding to its correct description. Two of the terms have no description and should not be used. (1pt for each answer)

	Term
A.	Vertical cable:
B.	Location of wiring closet:
C.	Backbone cable:
D.	Patch cables:
E.	Horizontal cable:
F.	Cable management System:
G.	Diagonal cable:
H.	Serial cable:

	Description	Match
1	Cable from the IDF to the MDF in the organization's backbone area	A
2	Short cable from the computer to the wall plate in the user work area	D
3	Series of trays and straps used to guide and protect cable runs	F
4	Cable from the wall plate to the IDF in the distribution area	E
5	Area to concentrate end user cable to hub or switch	B
6	The part of a network that handles the major traffic	C

Ερώτηση 5. (Chapter 7)

User 1 downloads email messages from her mail box on Server A (the messages downloaded are removed from the server). Then she sends an email message to User 2, whose email box is on Server B. The message is first received by Server A, which sends it to Server B. User 2 reads the message from his mailbox on Server B and then archives it in a folder, which is also part of the mailbox on Server B.

The following table lists three well-known ports used for email service. Copy the table in your answer book and complete it writing clearly the service that corresponds to each port. Also give an example from the above description that clearly shows where each protocol/service is used. (1 pt for each answer)

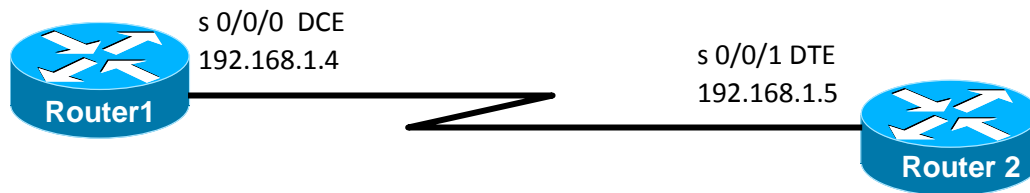
Port	Service	Example of its use
25	SMTP	User 1 sends message to Server A/Server A forwards message to Server B
110	POP	User 1 downloads messages from her mailbox on Server A
143	IMAP	User 2 reads message from his mailbox on Server B

ΜΕΡΟΣ Γ (24 Μονάδες)

Να απαντήσετε σε όλες τις ερωτήσεις. Η κάθε ερώτηση βαθμολογείται με οκτώ (8) μονάδες.

Ερώτηση 1. (Chapter 5)

Answer the following questions based on the network diagram below:



- (a) Give the necessary commands for configuring and activating the serial interface S0/0/0 of Router1 (IP 192.168.1.4). Assume that the router is initially in privileged mode. (5 pts)

Router1# configure terminal	(1 pt)
Router1(config)# interface serial 0/0/0	(1pt)
Router1(config-if)# ip address 192.168.1.4 255.255.255.0	(1pt)
Router1(config-if)# clock rate 64000	(1pt)
Router1(config-if)# no shutdown	(1pt)
Router(config)# exit	(δεν είναι απαραίτητο)



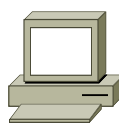



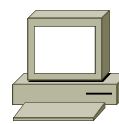


- (b) Give the necessary command to configure a default route on Router1. Assume that the router is in global configuration mode (1 pt)

Router1(config)# ip route 0.0.0.0 0.0.0.0 S0/0/0	(1pt)
Or	
Router1(config)# ip route 0.0.0.0 0.0.0.0 192.168.1.5	(1pt)

- (c) Give the necessary command to configure the word CISCO as the password to access the console port. Assume that the router is in global configuration mode (2 pts)

Router1(config)# line con 0	(0,5 pt)
Router1(config-line)# password CISCO	(1 pt)
Router2(config-line)# login	(0,5 pt)

Ερώτηση 2.

Network Diagram Icons				
Routers	Switch	Hosts	Cables	
R1  Interfaces: Serial 0/0/0 (DCE) Fast Ethernet 0/0	S1 	H1 	Serial 	Console 
R2  Interfaces: Serial 0/0/0 (DTE) Fast Ethernet 0/0		H2 	Straight-through 	Crossover 

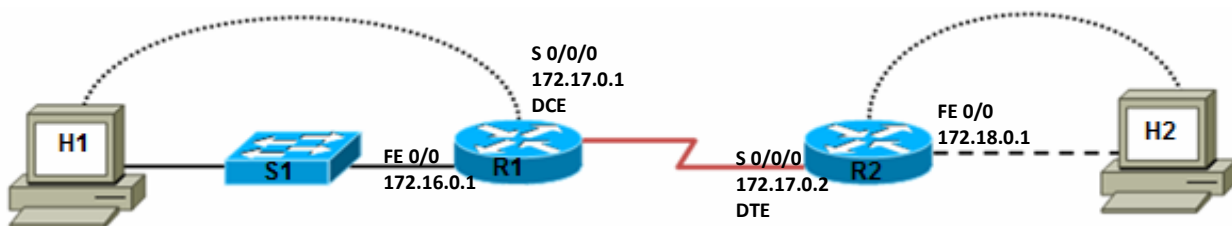
(a) Using the above icons and the information that follows, draw in your answer book a clearly labelled network diagram (show interface numbers and IP addresses for each interface) to connect the two geographically separated hosts (H1 and H2). The first host H1 is connected through a switch to the R1 router whilst the host H2 is directly connected to the R2 router. The two routers are connected through their serial ports and belong to a network with ID 172.17.0.0 and subnet mask 255.255.255.224. The two hosts are used as consoles for configuring their corresponding routers. The Ethernet network ID on the R1 router is 172.16.0.0 with subnet mask 255.255.255.0 and the Ethernet network ID on the R2 router is 172.18.0.0 with subnet mask 255.255.255.0

Note: For router interfaces use the first or the last valid IP address of each network.

Answer

3 pt for using correct cables (0.5 for each cable)

2 pt for the router interfaces (0.5 for the interface and its ip address)



(b) Show the configuration for the two hosts so that they can connect to their corresponding networks. (0.25 pt for each item)

H1		H2	
IP address	172.16.0.2	IP address	172.18.0.2
Subnet mask	255.255.255.0	Subnet mask	255.255.255.0
Default gateway	172.16.0.1	Default gateway	172.18.0.1

(c) Write a command for testing the connectivity between the two hosts. (0.5 pt)

From host H1 give the command Ping 172.18.0.2 or tracert 172.18.0.2

Ερώτηση 3.

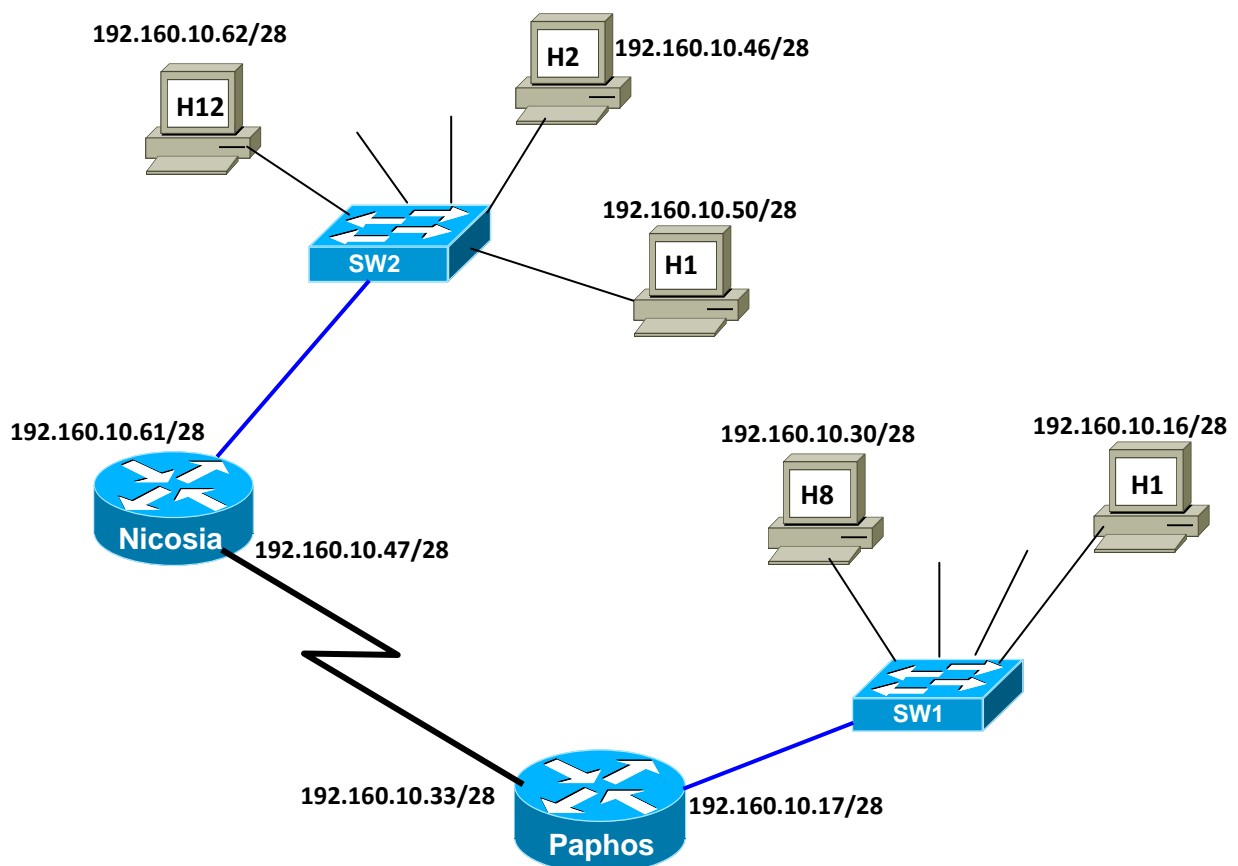
New Tech Ltd is planning a new network. Their ISP assigned the company with the network address 190.35.0.0. The company's network engineer has designed a network with 750 subnets.

Based on the above information answer the following questions: (1 pt for each answer)

	Question	Answer
(a)	Address Class	Class B
(b)	Default subnet mask	255.255.0.0
(c)	Custom subnet mask to support 750 subnets	255.255.11111111.11000000 255.255.255.192
(d)	Number of bits borrowed	10 bits
(e)	Number of usable hosts per subnet	62 hosts
(f)	maximum number of subnets	1024 subnets
(g)	Network address of the fifth subnet	190.35.1.64
(h)	Broadcast address of the fifth subnet	190.35.1.127

ΜΕΡΟΣ Δ (16 Μονάδες)

Να απαντήσετε στην πιο κάτω ερώτηση.



A small company has offices in Nicosia and Paphos but is planning to expand in several other locations with no more than 9 hosts per location. The company hired a network technician to design its network. The initial network design is as shown above.

(a) Based on the above scenario answer the following questions: (1.5 pt for each item)

Question	Answer
network address given by the ISP (before subnetting)	192.160.10.0
default subnet mask	255.255.255.0
Address Class	Class C
Custom subnet mask	255.255.255.240
How many subnets are left for expansion	13

(b) The network technician made 3 mistakes in the initial network configuration. In the table below specify the mistake, the reason it is wrong and the correct address. (0.5 pt for each item)

Number	Mistake	Reason	Correction
1	192.160.10.46/28	Belongs to a different network	192.160.10.51/28 Or any valid
2	192.160.10.47/28	Broadcast address of 3rd subnet	192.160.10.34/28 Or any valid
3	192.160.10.16/28	Network address of 2nd subnet	192.160.10.17/28 Or any valid

(c) Assuming that the network design is corrected according to your answer above and that all interfaces are configured correctly, give the commands for configuring rip version 2 on the two routers. Ignore the router prompts: (2 pts for each router)

Router Nicosia
 Router rip
 Version 2
 Network 192.160.10.48
 Network 192.160.10.32

Router Paphos
 Router rip
 Version 2
 Network 192.168.10.48
 Network 192.160.10.32

ΤΕΛΟΣ ΕΞΕΤΑΣΗΣ